What is claimed is:

1. A method for compensating transmission line loss of a laser drive signal, comprising:

providing a transmission line between a laser driver circuit and a laser diode, the transmission line having coupled thereto a set of bias impedance circuits corresponding to a predefined set of operating frequencies of the laser drive signal, wherein each bias impedance circuit of the set of bias impedance circuits is configured to generate a frequency response that compensates for the laser drive signal loss of the transmission line at a distinct corresponding operating frequency; and

driving the laser drive signal from the laser driver circuit to the laser diode through the transmission line, the laser drive signal operating within a range of frequencies associated with the predefined set of operating frequencies.

2. The method of claim 1, wherein the laser driver circuit comprises:

a differential pair of transistors having drain terminals coupled to a power supply and gate terminals coupled to a pair of differential input signals;

a current source coupled between source terminals of the differential pair of transistors and a circuit ground; and

a pair of output ports coupled to the drain terminals of the differential pair of transistors.

3. The method of claim 1, wherein the set of bias impedance circuits comprises a set of frequency dependent impedance circuits connected in series, each frequency dependent impedance circuit comprising a resistor, an inductor and a capacitor connected in parallel, and wherein each frequency dependent impedance circuit is configured to produce a desired impedance at the corresponding operating frequency.

4. The method of claim 1, wherein the set of bias impedance circuits is configured to produce a substantially zero impedance when the operating frequency is approximately zero and is further configured to produce a predetermined non-zero impedance at each operating frequency of a predetermined set of operating frequencies.

5. The method of claim 3, wherein the operating frequency of each respective frequency dependent impedance circuit is a resonance frequency of the respective frequency dependent impedance circuit.

6. The method of claim 3, wherein the resistor of each respective frequency dependent impedance circuit is tuned to optimize the efficiency of the laser driver circuit and the quality of the laser drive signal in accordance with a set of predetermined system design criteria.

7. A circuit for compensating transmission line loss of a laser drive signal, comprising:

a laser driver circuit;

a laser diode;

a transmission line for connecting the laser driver circuit to the laser diode; and

a set of bias impedance circuits, the set of bias impedance circuits having a first terminal coupled to a power supply and a second terminal coupled to the transmission line, wherein each bias impedance circuit of the set of bias impedance circuits is configured to generate a frequency response that compensates for laser drive signal loss of the transmission line at a distinct corresponding operating frequency.

8. The circuit of claim 7, wherein the laser driver circuit comprises:

a differential pair of transistors having drain terminals coupled to a power supply and gate terminals coupled to a pair of differential input signals;

a current source coupled between source terminals of the differential pair of transistors and a circuit ground; and

a pair of output ports coupled to the drain terminals of the differential pair of transistors.

9. The circuit of claim 7, wherein the set of bias impedance circuits comprises a set of frequency dependent impedance circuits connected in series; each frequency dependent impedance circuit comprises a resistor, an inductor and a capacitor connected in parallel; and each frequency dependent impedance circuit is configured to produce a desired impedance at the corresponding operating frequency.

10. The circuit of claim 7, wherein the set of bias impedance circuits is configured to produce a substantially zero impedance when the operating frequency is approximately zero and is further configured to produce a predetermined non-zero impedance at each operating frequency of a predetermined set of operating frequencies.

11. The circuit of claim 9, wherein the operating frequency of each respective frequency dependent impedance circuit is a resonance frequency of the respective frequency dependent impedance circuit.

12. The circuit of claim 9, wherein the resistor of each respective frequency dependent impedance circuit is tuned to optimize the efficiency of the laser driver circuit and the quality of the laser drive signal in accordance with a set of predetermined system design criteria.

13. A method for operating a laser driver circuit, wherein the laser driver circuit drives a laser drive signal to a laser diode through a transmission line, comprising:

providing a set of source impedance circuits for the laser driver circuit, wherein the set of source impedance circuits produces a substantially zero impedance when the operating frequency is approximately zero and produces a predetermined non-zero impedance at each operating frequency of a predefined set of operating frequencies; and

driving the laser driver circuit with an input signal, the input signal operating within a range of frequencies associated with the predefined set of operating frequencies.

14. The method of claim 13, wherein the laser driver circuit comprises:

a differential pair of transistors having each drain terminal coupled to a power supply through the set of source impedance circuits and gate terminals coupled to a pair of differential input signals;

a current source coupled between source terminals of the differential pair of transistors and a circuit ground; and

a pair of output ports coupled to the drain terminals of the differential pair of transistors.

15. The method of claim 13, wherein the set of source impedance circuits comprises a set of frequency dependent impedance circuits connected in series; each frequency dependent impedance circuit comprises a resistor, an inductor and a capacitor connected in parallel; and each frequency dependent impedance circuit is configured to produce the predetermined impedance at the corresponding operating frequency.

16. The method of claim 13, wherein the set of source impedance circuits is configured to generate a frequency response that compensates for the laser drive signal loss due to the frequency response of the transmission line at a distinct corresponding operating frequency.

17. The method of claim 15, wherein the operating frequency of each respective frequency dependent impedance circuit is a resonance frequency of the respective frequency dependent impedance circuit.

18. The method of claim 15, wherein the resistor of each respective frequency dependent impedance circuit is tuned to optimize the efficiency of the laser driver circuit and the quality of the laser drive signal in accordance with a set of predetermined system design criteria.

19. A laser driver circuit, wherein the laser driver circuit drives a laser drive signal to a laser diode through a transmission line, comprising:

a differential pair of transistors having each drain terminal coupled to a power supply through a set of source impedance circuits and gate terminals coupled to a pair of differential input signals, wherein the set of source impedance circuits produces a substantially zero impedance when the operating frequency is approximately zero and produces a predetermined non-zero impedance at each operating frequency of a predefined set of operating frequencies, and wherein the differential input signals operate within a range of frequencies associated with the predefined set of operating frequencies;

a current source coupled between source terminals of the differential pair of transistors and a circuit ground; and

a pair of output ports coupled to the drain terminals of the differential pair of transistors.

20. The laser driver circuit of claim 19, wherein the set of source impedance circuits comprises a set of frequency dependent impedance circuits connected in series, each frequency dependent impedance circuit comprises a resistor, an inductor and a capacitor connected in parallel, and each frequency dependent impedance circuit produces the predetermined impedance at the corresponding operating frequency.

21. The laser driver circuit of claim 19, wherein the set of source impedance circuits is configured to generate a frequency response that compensates for the laser drive signal loss due to the frequency response of the transmission line at a distinct corresponding operating frequency.

22. The laser driver circuit of claim 20, wherein the operating frequency of each respective frequency dependent impedance circuit is a resonance frequency of the respective frequency dependent impedance circuit.

23. The laser driver circuit of claim 20, wherein the resistor of each respective frequency dependent impedance circuit is tuned to optimize the efficiency of the laser driver circuit and the quality of the laser drive signal in accordance with a set of predetermined system design criteria.